

Notic of Allowability

Application N .

10/815,445

Examiner

Sonny TRINH

Applicant(s)

LEE ET AL.

Art Unit

2618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 04/01/04.
2. ☒ The allowed claim(s) is/are 1-12.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
- ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
- ☒ Examiner's Amendment/Comment
- ☐ Examiner's Statement of Reasons for Allowance
- ☐ Other _____

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed on 08/04/04 and 02/22/05 have been considered and placed in the application file.

Allowable Subject Matter

2. **Claims 1-12** are allowed.

The following is an examiner's statement of reasons for allowance:

The present invention relates generally to a self-calibrating apparatus and method in a mobile transceiver, and in particular, to an apparatus and method for self-calibrating non-linearity and mismatching between orthogonal signals generated in a mobile transceiver.

The closest prior art, Shah (U.S. Patent Application Publication US 2003/0186664 A1) shows an automatic calibration circuit for distortion reduction in a wireless communication device having a receiver, the circuit comprising: a signal source to generate a test signal; and a selectively activated switch circuit to couple the signal source to the receiver input terminal when selectively activated to couple the test signal to the receiver input terminal and thereby permit distortion reduction adjustments on the receiver.

Regarding **claim 1**, Shah fails to disclose "the method comprising the steps of: providing an output of the transmitter to the receiver via the switch; generating a first test signal associated with the in-phase output terminal and transmitting the first test signal through the transmitter; detecting an in-phase measurement signal provided via the in-phase input terminal and a quadrature-phase measurement signal provided via the quadrature-phase input terminal by processing the first test signal received via the switch in the receiver; if the quadrature-phase measurement signal does not have a value approaching '0', calibrating mismatching of the quadrature-phase measurement signal by controlling the receiver, estimating distortion in the in-phase measurement signal, and then calibrating the distortion of the in-phase measurement signal by controlling the receiver; generating a second test signal associated with the quadrature-phase output terminal, and transmitting the second test signal via the transmitter; detecting an in-phase measurement signal provided via the in-phase input terminal and a quadrature-phase measurement signal provided via the quadrature-phase input terminal by processing the second test signal received via the switch in the receiver; if the in-phase measurement signal does not have a value approaching '0', calibrating mismatching of the in-phase measurement signal by controlling the receiver, estimating distortion in the quadrature-phase measurement signal, and then calibrating the distortion of the quadrature-phase measurement signal by controlling the receiver; and if the calibration of the mismatching and the distortion is completed, controlling the switch to cut off a connection between the output terminal of the transmitter and the input terminal of the receiver."

Regarding **claim 3**, this claim is similar to claim 1 for controlling the transmitter as opposed to the controlling of the receiver as specified in claim 1 and is therefore allowed for the same reasons.

Regarding **claim 5**, Shah also fails to disclose a method for self-calibrating mismatching and non-linearity occurring in a receiver in a mobile terminal including a transmitter, the receiver, a switch for connecting an output terminal of the transmitter to an input terminal of the receiver, and a controller having an in-phase output terminal and a quadrature-phase output terminal connected to the transmitter, and having an in-phase input terminal and a quadrature-phase input terminal connected to the receiver, the method comprising the steps of: providing an output of the transmitter to the receiver via the switch; generating a first test signal associated with the in-phase output terminal and transmitting the first test signal through the transmitter; estimating mismatching in a first quadrature-phase measurement signal provided via the quadrature-phase input terminal and non-linearity in a first in-phase measurement signal provided via the in-phase input terminal, by processing the first test signal received via the switch in the receiver; generating a second test signal associated with the quadrature-phase output terminal, and transmitting the second test signal via the transmitter; estimating mismatching in a second in-phase measurement signal provided via the in-phase input terminal and non-linearity in a second quadrature-phase measurement signal provided via the quadrature-phase input terminal, by processing the second test signal received via the switch in the receiver; calibrating, in the receiver, the mismatching measured on the first quadrature-phase measurement signal and the

second in-phase measurement signal and the non-linearity measured on the first in-phase measurement signal and the second quadrature-phase measurement signal; and if the calibration of the mismatching and the distortion is completed, controlling the switch to cut off a connection between the output terminal of the transmitter and the input terminal of the receiver.

Regarding **claim 7**, this claim is similar to claim 5 for calibrating the transmitter as opposed to the calibrating of the receiver as specified in claim 5 and is therefore allowed for the same reasons.

Regarding **claims 9 and 11**, the prior art of record also fail to show the apparatus and method for self-calibrating non-linearity in a mobile terminal including a transmitter and a receiver, comprising a switch for connecting an output terminal of the transmitter to an input terminal of the receiver according to a switching control signal; and a controller for generating, when calibration on non-linearity is requested, a predetermined test signal after outputting the switching control signal, outputting the generated test signal via the transmitter, estimating non-linearity based on a test signal received via the receiver, calibrating non-linearity in a reception side by controlling the receiver, and calibrating non-linearity in a transmission side by controlling the transmitter.

Claims 2, 4, 6, 8, 10, and 12 are allowed by virtue of their dependency on claims 1, 3, 5, 7, 9, and 11

Conclusion

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sonny TRINH whose telephone number is 571-272-7927. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward URBAN can be reached on 571-272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

6/5/06


SONNY TRINH
PRIMARY EXAMINER